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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/010,633	11/07/2001	Li-Anne Liew	116-08	4899
23713 7590 08/19/2008 GREENLEE WINNER AND SULLIVAN P C 4875 PEARL EAST CIRCLE SUITE 200 BOULDER, CO 80301				
EXAMINER				
RALIS, STEPHEN J				
ART UNIT		PAPER NUMBER		
3742				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/010,633

Applicant(s)

LIEW ET AL.

Examiner

STEPHEN J. RALIS

Art Unit

3742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 August 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 26-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 26-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 November 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
- Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. Applicant is respectfully requested to provide a location within the disclosure to support any further amendments to the claims due to when filing an amendment an applicant should show support in the original disclosure for new or amended claims. See MPEP § 714.02 and § 2163.06 ("Applicant should specifically point out the support for any amendments made to the disclosure.").

Response to Amendment/Arguments

3. The indicated allowability of claims 26-30 is withdrawn in view of the newly discovered reference(s) to Hoshizaki et al. (U.S. Patent No. 4,723,069), Yano (U.S. Patent No. JP 08094298 A) and Lian (U.S. Reissue Patent No. 27,557). Rejections based on the newly cited reference(s) follow.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).
7. Claims 26-28 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoshizaki et al. (U.S. Patent No. 4,723,069) in view of Cote et al. (U.S. Patent No. 6,195,247) and Yano (U.S. Patent No. JP 08094298 A).
- Hoshizaki et al. discloses a glow plug comprising: a ceramic heating element (Figure 1) having a first arm (leg portion 2a) having a first width, a second arm (leg portion 2b) having a second width, and a tip (closed loop portion1) having a third width that is less than the first and second widths (see Figure 1), the first arm (leg portion 2a) and second arm (leg portion 2b) connected to the tip (closed loop portion1) (see Figure 1); a first connecting apparatus (see Figure 7) for electrically connecting a voltage source across the first arm (leg portion 2a) and the second arm (leg portion 2b) so that

when current is applied to the connecting apparatus (see Figure 7) a current flows through the ceramic heating element (see Figure 1) wherein the current density at the tip (closed loop portion1) is increased due to the decreased third width of the tip (closed loop portion1) to generate a high operating temperature at the tip while the first arm (leg portion 2a) and the second arm (leg portion 2b) remain relatively cool; and a body (see Figure 7) having a first end (m1) and a second end (outer ring portion; see Figures 1, 7); wherein there are two or more of the ceramic heating elements integrally connected to the first end (m1) of the body (see Figure 7), the first arm (leg portion 2a) of the two or more ceramic heating elements interconnected (see Figure 1).

With respect to the limitations of claim 27, Hoshikazi et al. disclose the body being cylindrical (see Figure 7)

Hoshizaki et al. disclose all of the limitations of the claimed invention, as previously set forth, except for the connecting apparatus comprising a switching voltage source and a switch apparatus for electrically connecting the switching voltage source across the interconnected first arm of the two or more ceramic heating elements and each second arm of the two or more ceramic heating elements so that a current flows through a first one of the two or more ceramic heating elements and the switching voltage source switches voltage to the next second arm of the next one of the two or more ceramic heating elements when the first one of the two or more ceramic heating elements fails.

However, a connecting apparatus comprising a switching voltage source and a switch apparatus for electrically connecting the switching voltage source across the

interconnected first arm of the two or more ceramic heating elements and each second arm of the two or more ceramic heating elements so that a current flows through a first one of the two or more ceramic heating elements and the switching voltage source switches voltage to the next second arm of the next one of the two or more ceramic heating elements when the first one of the two or more ceramic heating elements fails is known in the art. Cote et al., for example, teach a multiple igniter system comprising an exciter circuit comprising a capacitor, circuit for charging the capacitor, one or more igniter plugs in the circuit and a switching mechanism as part of the discharging circuit connected between the capacitor and the igniter (column 1, lines 11-17). In addition, Cote et al. teach a Full Authority Digital Engine Control (FADEC) that permits automated detection of the exciter failure, and the ability to switch to working exciters in the event of such a failure (column 2, lines 47-49; column 2, lines 16-24) that receives feedback from sensors (column 1, lines 27-31). Cote et al. further teach the advantage of such a configuration provides continued operation despite failure of the exciters, thereby reducing the overall down time of the system (column 1, lines 49-52).

Similarly, Hoshizaki et al. disclose all of the limitations of the claimed invention, as previously set forth, except for the glow plug/igniter being a micro-glow plug/igniter.

However, a micro-glow plug/igniter arrangement is known in the art. Yano, for example, teaches an application in which trajectory structures involving micro-rocket motors in rows and columns arranged in annular configurations having an igniter for each micro-rocket (English translation Abstract). Yano further teaches the advantage of

such a configuration provides a means for the controller to be actually mounted in a small space.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate a control module that provides the ability to detect an igniter failure event and automatically switch to a working igniter in the event of such a failure as taught by Cote et al. in order to provide continued operation despite failure of the igniters, thereby reducing the overall down time of the system. It would have further been obvious to one of ordinary skill in the art at the time of the invention was made to modify the silent size of the Hoshizaki et al. glow plugs with the micro domain teaching of Yano in order to provide a means for the controller and micro-glow plugs to be mounted and utilized in a small space.

8. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hoshizaki et al. (U.S. Patent No. 4,723,069) in view of Cote et al. (U.S. Patent No. 6,195,247) and Yano (U.S. Patent No. JP 08094298 A) as applied to claims 26-28 and 30 above, and further in view of Lian (U.S. Reissue Patent No. 27,557).

Hoshizaki et al. in view of Cote et al. discloses all of the claimed limitations, as previously set forth, except for the sensor being connected in serial between the switching apparatus and said power source.

However, a sensor being connected in serial between the switching apparatus and said power source is known in the art. Lian, for example, teaches a sequential switching circuit (6) in series with load (4). In addition, Lian teaches a sensor (8; column

4, lines 17-22) further connected in series with the sequential switching circuit to sense any fault in the line (column 4, lines 13-29; see Figure 1). Lian further teaches many advantages of such a configuration, one of which is providing an electric switch which has a high degree of reliability and long life (column 3, lines 15-23). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify Hoshizaki et al. in view of Cote et al. with the sensor being connected in serial between the switching apparatus and said power source of Lian in order to sense any fault in the line and provide an electric switch which has a high degree of reliability and long life.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to STEPHEN J. RALIS whose telephone number is (571)272-6227. The examiner can normally be reached on Monday - Friday, 8:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tu Hoang can be reached on 571-272-4780. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Stephen J Ralis/
Primary Examiner, Art Unit 3742

Stephen J Ralis
Primary Examiner
Art Unit 3742

SJR
August 8, 2008